Research on talent cultivation of software engineering under the background of integration of industry and education

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Abstract. With the rapid development of information technology, The Internet, Cloud Computing, Big Data Etc. Various emerging scientific and technological means and thinking modes are quietly and profoundly changing the thinking, production and learning methods of human society. At present, the education industry generally regards the integration of production and education as the path of vocational education development and personnel training, This paper discusses the current situation of the integration of industry and education, Analyze the problems in the process of the integration of industry and education, The talent cultivation scheme of software engineering under the background of integration of industry and education is proposed.

1 Introduction

In 2017, Enterprises will be encouraged to participate in the operation of vocational schools and universities in the form of sole proprietorships or joint ventures, and grant more intern vacancies to students to strengthen cooperation with educational institutes, according to a notice released by the State Council. It is an urgent requirement to implement the structural reform of the supply side of human resources[1]. Accompanied by a series of related policy announcement and implementation, The integration of production and education has gradually changed from the single to the diversified and the superficial integration to the overall integration.

Fig. 1. Research methods.

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As shown in Figure 1, through the above research methods, this paper obtains a set of talent training program suitable for software engineering major.

2 Development status of integration of production and education in higher vocational colleges

2.1 The policy guarantee mechanism is not sound

In recent years, the government has promulgated policy documents related to the integration of industry and education, although governments at all levels have taken into account the implementation of industry-education integration policies when formulating policies, however, in the process of implementation of industry-education integration, there are still unclear responsibilities of government departments and industry enterprises, imperfect security system and working mechanism, and lack of policy guarantee in the process of implementation. For software engineering majors, at present, there is no clear policy to define the rights and obligations of both schools and enterprises, there is also no regulatory body to monitor and evaluate cooperation between the two. This will lead to less interest in the participation of both schools and enterprises, and the quality of the integration of production and education is difficult to measure, which is not conducive to the improvement of the quality of talent training.

2.2 School-enterprise cooperation is superficial, and the enthusiasm of enterprises is not high

In the process of implementing the integration of industry and education, it is a basic requirement for enterprises to participate in the course construction process of schools. It mainly includes specialty construction, curriculum construction, teaching staff construction and teaching evaluation, etc. However, the enthusiasm of enterprises is not high enough and remains on the surface. The reason for this is that enterprises usually start from their own interests and think that too much participation in the integration of industry and education can not bring profits to the enterprise. Enterprises believe that participating in the process of industry-education integration and collaborative education is mostly to provide a training base for schools and perform the function of training students. The attitude that the integration of industry and education can improve the quality of employees, improve production efficiency and help enterprises to innovate is not optimistic. Some higher vocational colleges cannot provide services such as staff training and technical research and development support for enterprises. In addition, the preferential policies provided by the government to enterprises participating in the integration of industry and education are weak and not fully implemented, which results in the weak attraction degree of school-enterprise cooperation to enterprises. In addition, industry organizations and associations have a low sense of presence in the process of industry-education integration, supervision and guidance are not in place, as a result, enterprises did not get the expected benefits in the process of participation, and the enthusiasm fades away, lose the motivation to continue to participate in collaborative school running.

2.3 The construction of teaching staff needs to be improved

Vocational colleges and universities pay more attention to teaching and research, in the final analysis, because teaching and research results are important indicators of education system, from the education administration department to the university, then to the
secondary college to grassroots teachers, this indicator is exerting enormous influence. For a long time, vocational education and general higher education follow the same evaluation mechanism. Compared to quantifiable results of teaching and research, the evaluation of practical ability became dispensable, according to the survey, many vocational colleges have the phenomenon of “attaching importance to academic work and neglecting practice”. Many vocational colleges have followed the applied college talent introduction model, these colleges and universities are heavily recruiting new master's and doctoral graduates, these fresh graduates often have a high academic record and a solid theoretical foundation, but they have not worked in enterprises and lack practical experience. They are often entrusted with heavy responsibilities and do scientific research vigorously, which leads to lack of practical training opportunities for them. The reason for this is that schools emphasize theory over practice.

2.4 The curriculum structure is different from the industry demand, needs to be adjusted

The core of the talents training of the integration of production and education in higher vocational colleges is to cultivate talents who can adapt to the production of the industry and enterprises, therefore, in terms of specialty setting, higher vocational colleges should be closely connected with the needs of related industries and enterprises to build the curriculum system. At the same time, the current situation and future development trend of each specialty should be analyzed scientifically, scientific design of the industry-education integration of the course system, through the research industry enterprise talent demand characteristics and the professional graduates employment destination information, take this as the benchmark, overall planning, adjustment of the professional enrollment, curriculum, faculty, theoretical courses and practical courses proportion. From the perspective of curriculum provision, the curriculum provision of higher vocational colleges should be forward-looking, and actively docking with the industrial structure and future planning of the region. However, when vocational colleges offer courses, they often place more emphasis on theory than practice. Once the proportion of class hours can not be arranged, the first choice will be to reduce the practice class. The time for concentrated practical training is more limited, which is usually arranged in the third semester after the normal teaching. The content of practical training is mainly based on the cases in textbooks, which cannot be closely related to the cutting-edge knowledge and new technology of The Times.

3 The development strategy of integration of industry and education in software engineering major of higher vocational colleges

3.1 Strengthen the promotion of the policy system of production-education integration

At present, the government has issued a series of policy documents related to the integration of industry and education, providing strong support for the training of talents in the integration of industry and education in terms of policy guarantee. To a certain extent, it has played a role in guiding and promoting the school-enterprise cooperation for the integration of industry and education, and is also an indispensable link in the training system of talents for the integration of industry and education. In the specific implementation process, local education authorities should adhere to local conditions, combined with local industrial development, detailed analysis of the policy, the
implementation of responsibilities and rights. Schools should stand in the perspective of "country, region and university", and actively strive to build a cooperation framework among the government, industry, enterprises and schools, and form an ecological chain of integration of industry and education with the linkage of "government, industry, enterprise and school". The government should restrict the responsibility of enterprises in vocational education from the legal level. On the one hand, it should determine the rights and responsibilities of the responsible subjects in the form of legislation, and strengthen the rigid conditions for the responsible subjects to perform their duties. On the other hand, it is necessary to cultivate the consciousness of responsibility subject of industry enterprises through policy guidance and policy incentive, so that enterprises can generate continuous motivation to undertake the responsibility of vocational education.

3.2 Deepen school-enterprise cooperation

Enterprises need to improve their awareness of social responsibility, clarify their obligations and responsibilities in talent training, and establish a better social service attitude and awareness. Enterprises should establish a good awareness of the integration of in-depth production and education, so as to provide necessary support for actively creating a good social environment. Enterprises need to realize that the integration of industry and education can improve the conversion rate of research results. It can not only provide teachers and student teams for technology research and development of enterprise, but also provide places and equipment for teachers and students. Enterprises should also be aware of the necessity of cooperating with application-oriented universities to build majors and courses, because jointly building majors, courses and discussing talent training programs can help enterprises to understand the current situation of talent training and master the basic situation of talent training, and at the same time improve the quality of talent training by making talent training objectives that are more in line with the actual needs of enterprises. And increase the enterprise's own human capital. In order to raise the awareness of enterprises, the government should encourage and commend enterprises with deeper integration between industry and education and set up exemplary units to deepen the cooperation between industry and education.

3.3 Strengthen the construction of teaching staff and create a "double-qualified" teacher team

Under the background of the integration of industry and education, the teacher training mode of vocational colleges should take advantage of the cooperation between schools and enterprises to build a teacher team construction mode of mutual training and mutual employment, and promote the multi-level and three-dimensional development of school teachers. This requires a set of effective teacher training mechanism between schools and enterprises, so as to promote teachers to actively participate in the teacher training organized by enterprises and improve their skills. The school can regularly invite well-known experts at home and abroad to conduct in-depth academic exchanges and discussions with teachers. At the same time, the school can employ well-known entrepreneurs, enterprise engineers and outstanding talents in various aspects to serve as part-time teachers. This is not only conducive to the cultivation of students, but also can improve the teacher's project-based teaching ability. Schools can also send teachers to work as interns in enterprises during winter and summer vacations, and formulate preferential promotion policies for teachers who participate in on-the-job practice. At the same time, young teachers are encouraged to conduct academic visits to higher level universities, study for doctor's degree and study abroad. While improving themselves, they can also introduce
advanced teaching concepts to the school and improve the overall teaching ability of teachers.

3.4 Optimize the course structure

With the continuous development and changes of the social economy, it is necessary to improve the professional curriculum system, timely update to meet the needs of different professions, highlight the cultivation of students' vocational skills, promote the development of curriculum teaching, so that students fully understand the professional knowledge and the knowledge and ability structure of corresponding positions. From the perspective of curriculum setting, the curriculum setting of higher vocational colleges should be forward-looking, actively connect with the industrial structure and future planning of the local area, explore and establish the three-level curriculum system: that is, the first-level curriculum is taught by teachers, teachers will not only teach professional theoretical knowledge, but also stimulate students' learning interest and initiative; The second-level curriculum is a combination of theoretical teaching and practice to strengthen the in-depth discussion between teachers and students; The third level courses are practical training courses. In the practical training courses, the work content in real industries and enterprises is simulated and restored, so that students can focus on solving practical problems and fully exercise and cultivate their practical operation ability.

4 Summary

The integration of production and education is an important direction for higher vocational colleges to carry out education reform at present. By carrying out the integration of production and education, it is helpful to promote students' understanding and absorption of theoretical knowledge. As an important base for conveying technical talents to the society, higher vocational colleges shoulder the important mission of cultivating diversified outstanding talents. With the gradual expansion of the scale of higher vocational colleges, talent training plans should also be constantly improved and innovative, combined with the needs of the development of society and enterprises for talents, targeted to develop the talent training mode, to cultivate excellent theoretical knowledge, outstanding technical ability of high-level talents, to make contributions to social development.

1. The 14th Five-Year Plan for National Business Education and Research in 2022, Research on Talent Cultivation in local Business Colleges under the background of integration of Industry and education, Project No.: SKJYKT-220706.
2. Innovation Training Program for College students Shandong Province in 2022, Coal mine gas detector based on FTIR, Project No.: S202213324011.

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